WE CLAIM:

1. A method of making a thin film transistor (TFT) array comprising the steps of:

a) providing a first substrate;

b) forming a plurality of TFT gate electrodes connected to gate lines on the substrate;

c) forming a gate insulating layer over the gate electrodes;

d) forming and patterning a semiconductor layer over each of the gate electrodes in TFT areas;

e) forming TFT source and drain electrodes in each TFT area with a TFT channel therebetween and a plurality of corresponding drain lines, thereby forming an array of TFTs on the first substrate;

f) depositing a photo-imageable insulating layer over a substantial portion of the substrate so as to cover substantial portions of the gate and drain lines and the TFTs in the array;

g) photo-imaging the insulating layer so as to form a plurality of vias or contact holes therein, at least one via corresponding to each TFT in the array;

h) forming a plurality of pixel electrodes over the insulating layer so that each pixel electrode is in communication with the source electrode of a corresponding TFT through one of the vias; and

i) forming the pixel electrodes on the substrate so that each pixel electrode overlaps one of the drain and gate lines whereby the pixel electrodes are insulated from the lines in the overlap areas by the photo-imaged insulating layer.

2. The method of claim 1, further including the steps of:

depositing the insulating layer in step f) as a negative resist;

irradiating the negative resist insulating layer with ultraviolet (UV) rays in step g); and

developing the irradiated negative resist insulating layer in step g) so as to remove areas which were not exposed to the UV rays thereby forming the vias.

3. The method of claim 2, further including the step of depositing the insulating layer in step f) so as to include photo-imageable benzocyclobutene (BCB) which is an organic material, thereby reducing capacitive cross-talk between the pixel electrodes and the lines in the overlap areas.

4. The method of claim 1, further comprising the step of depositing the insulating layer in step f) so that the insulating layer has a dielectric constant less than about 5.0.

5. The method of claim 4, further comprising the step of depositing the insulating layer in step f) so that the insulating layer has a dielectric constant less than about 3.0.

6. The method of claim 1, further comprising in step f) depositing the insulating layer including 2-Ethoxyethyl acetate.

7. The method of claim 1, wherein the insulating layer includes an organic mixture of 2-Ethoxyethyl acetate, methacrylate derivative copolymer, and polyfunctional acrylate.

8. A method of making a liquid crystal display including an array of semiconductor switching elements, the method comprising the steps of:

a) providing a first substrate;

b) forming an array of semiconductor based switching elements and corresponding address lines on the first substrate;

c) spin coating an organic photo-imageable insulating layer onto the first substrate over the switching elements and address lines;

d) photo-imaging the insulating layer in order to form a first group of vias or contact holes therein,

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each via in the first group corresponding to one of the switching elements; and

e) forming an array of pixel electrodes over the photo-imaged insulating layer so that each pixel electrode communicates with one of the switching elements through one of the vias in the insulating layer.

9. The method of claim 8, further comprising the step of photo-imaging in step d) the insulating layer to form a second group of vias or contact holes, each via in the second group corresponding to a storage capacitor of a pixel.

10. The method of claim 9, further comprising the steps of:

providing a second substrate, and sandwiching a liquid crystal layer between the first and second substrates so as to form the liquid crystal display.

11. The method of claim 8, further comprising the steps of:

in step d) irradiating or exposing the insulating layer with UV rays; and

following said irradiating, developing the photo-imaged insulating layer so as to remove non-exposed areas of the insulating layer so as to form the vias.

12. The method of claim 11, further including the step of curing the insulating layer after said developing step.

13. The method of claim 8, wherein the insulating layer formed in step c) includes one of: (i) BCB; and (ii) an organic mixture including 2-Ethoxyethyl acetate.

14. The method of claim 8, wherein said steps are performed in the order they are recited.

15. A method of making an array of semiconductor based thin film transistors (TFTs), the method comprising the steps of:

providing a first substantially transparent substrate;

forming an array of TFTs and corresponding address lines on the first substrate;

depositing an organic photo-imageable insulating layer over both the TFT array and corresponding address lines;

photo-imaging the insulating layer in order to form a first array of vias or contact holes therein; and

forming an array of electrode members on the first substrate over the photo-imaged insulating layer so that the electrode members in the array are in

communication with the corresponding TFTs through the first array of vias or contact holes.

16. The method of claim 15, further comprising the step of overlapping the address lines with the electrode members so that the photo-imaged insulating layer is disposed therebetween so as to reduce cross-talk.

17. The method of claim 16, further comprising the steps of (i) using the TFT array in one of a liquid crystal display and an image sensor, and (ii) forming the insulating layer so as to include one of photo-imageable BCB and 2-Ethoxyethyl acetate.

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